

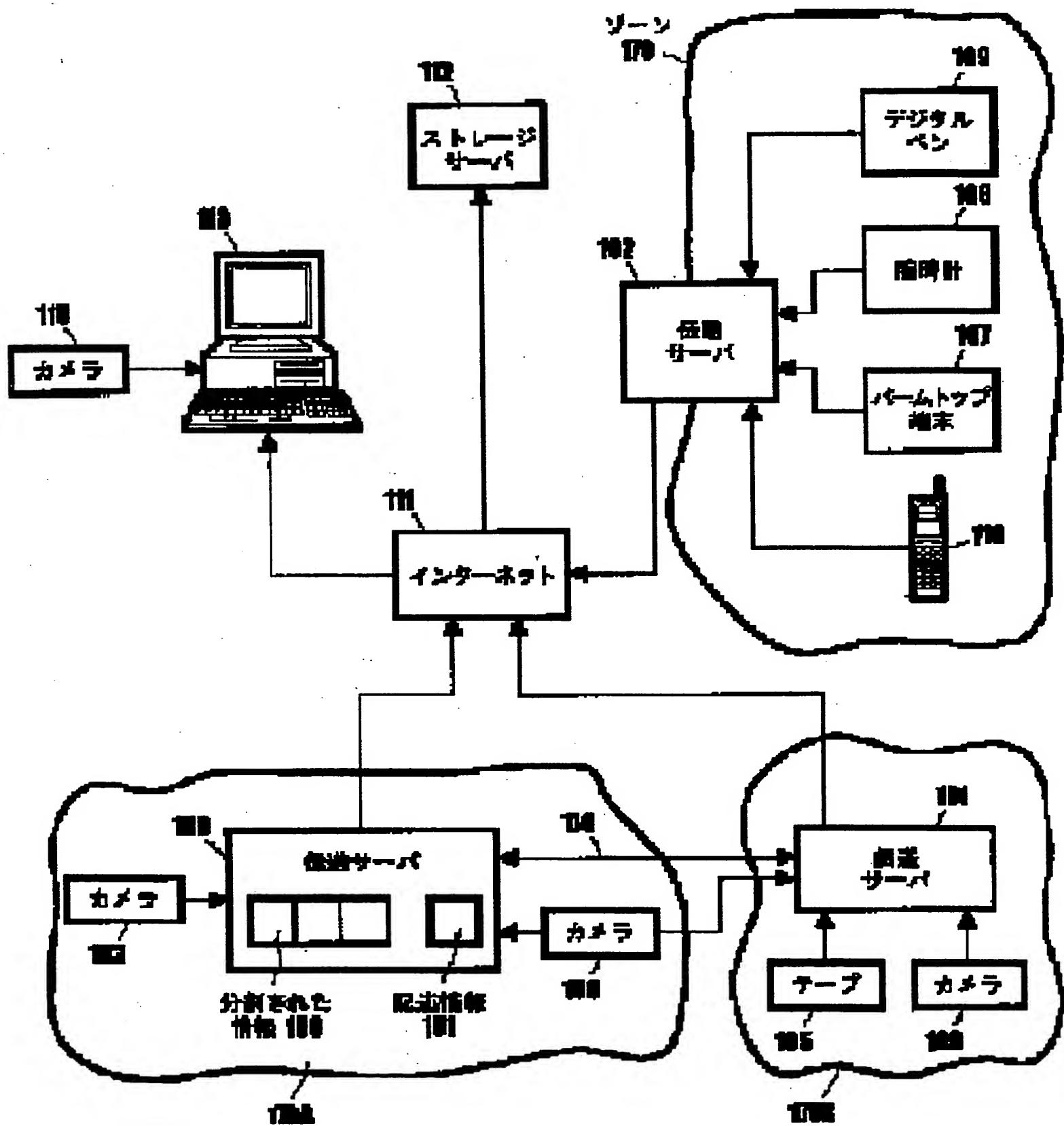
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TI - PORTABLE CALCULATION DEVICE, SERVER AND SYSTEM FOR
TRANSMITTING INFORMATION OF PORTABLE DEVICE TO NETWORK

AB - PROBLEM TO BE SOLVED: To provide a non-interruption type
method in order to free a storage of a portable device when the
storage is filled up.

SOLUTION: A non-interruption type method is provided to free a
storage of a portable device such as a digital camera when the
storage is filled up. This task is attained by means of a network
of a server which communicates with a portable device existing in
the server zone via a radio channel. When it's detected that a
storage of a camera, for example, is virtually filled with
photographed images or satisfies another standard, the server
transfers the stored images to a storage server without
interrupting the operations carried out by the owner of the
camera. Then the camera owner can load all transferred images
into his/her own computer from the storage server after he/she
returns home.

I - G06F13/00 ;G06F15/02 ;G06T1/60 ;H04N1/21 ;H04N5/907
PA - INTERNATL BUSINESS MACH CORP <IBM>
IN - KANEVSKIY DMITRIJ;URODEKKU VLADIMIR ZADOROZHNY
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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the storage in equipment including an inclusion chip. this invention relates to opening the storage in a camera (video), a palm top terminal, a tape, and a wrist watch in more detail.

[0002]

[Description of the Prior Art] Increasingly, the computer apparatus is carrying-sized and is coming to achieve a mobile user's individual function. The example of these "personal computers" contains a video camera, a tape, a palm top terminal, a wrist watch, and PDA (Personal Digital Assistants). Although these personal computers are convenient, the anamnesis is restricted and it needs to often download those memory.

[0003] For example, a digital camera obtains and memorizes a digital image. The digital camera has a comparatively small space (it is about 1MB of RAM, and is increasing every year now) for memorizing the incorporated picture. Usually, this is enough in order to memorize dozens of photographs. When the storage space of a digital camera fills, the owner downloads the memorized picture to his own computer, or he has to exchange the storage of a camera for a new camera storage disk (if storage is exchangeable). In order to access an owner's computer, an owner has to go to the place in which this computer is installed, has to call this computer, and has to download a picture through a modem line.

[0004] Since it is not always possible, any solution of interrupting one's action (for example, travel), in order to go to a computer or the place of a telephone is inconvenient. Other problems of downloading a picture through a telephone have comparatively late it, therefore it is needing a comparatively long connect time with a telephone / modem line.

[0005] The same problem arises about other digital equipments (a video camera, a tape, a palm top terminal, wrist watch, etc.) along which people have during a travel, a walk, or other actions, and walk.

[0006]

[Problem(s) to be Solved by the Invention] The purpose of this invention is to offer the systems and methods of having incorporated and having been improved for the re-load of the storage in equipment, such as a camera (video), a palm top terminal, a tape, a smart phon, and a wrist watch.

[0007] Other purposes of this invention have a user in things for which the system and method for the multitask operation in these inclusion equipment are offered, such as a camera (video), a palm top terminal, a tape, a smart phon, and a wrist watch, so that it may incorporate and execution of the basic function of equipment can be continued also during re-download of those storage.

[0008] Other purposes of this invention are to offer the systems and methods of having incorporated and having been improved for the non-interrupting type re-load of the storage in equipment, such as a camera (video), a palm top terminal, a tape, a smart phon, and a wrist watch.

[0009] The first portion which other purposes of this invention are enough since the two whole complementary portions, i.e., a part of the content, are expressed, and they incorporate a part of information memorized in inclusion equipment for reference in inclusion equipment, and is left behind into equipment, Although server storage reloaded, when it is combined with this first portion, it is in offering the system and method for dividing into the second portion which improves the

quality which have been improved.

[0010]

[Means for Solving the Problem] this invention offers the non-interrupting formula method for opening the storage of digital inclusion equipment like a camera (video), when it fills. This is performed through the server which incorporates by the radio circuit and communicates with a personal computer, when there is an owner of an inclusion personal computer, for example, (video), a camera, in the zone of a radio server. A special server reads periodically the data in which the storage situation is shown from the inclusion personal computer in the zone (physical distance). A server will investigate the owner instruction in an inclusion personal computer, if a thing near to the limit [an inclusion personal computer; for example, (video), the picture which the storage of a camera was incorporated, for example and was memorized,] is detected.

[0011] These owner instructions determine the address of e-mail address and others of the owner for a notice to the address of the storage server to which which information (for example, the number of which picture and which grades is it?) may be moved from memory, or they may be moved, and the owner about the moved position of a picture. These instructions can give the permission for such a re-load, without asking a user, including the demand which asks for permission of the user about what a picture is reloaded for.

[0012] When an owner instruction grants a permission, this server moves the memorized picture to a storage server (without interrupting the possible action of the owner in a camera (video)). A server moves the information/picture marked by the user according to the instruction memorized in the camera to a storage server. With a picture, a server can download the additional descriptive information (for example, time when the picture was generated) memorized in the inclusion personal computer (video) (camera) in relation to information/picture. When a user leaves [rather than] complicated information (for example, geographical description, a name) about a picture, this information is also loaded into a storage server.

[0013] This re-load may be performed without interrupting an owner's action. That is, an owner can continue the action as usual [using the camera] (for example, photography of a new photograph), while the camera (video) is reloading. An owner can download all information/pictures that were moved from a storage server to an owner's computer, after returning to a house, office, a hotel, etc.

[0014] Although this indication mainly uses the digital camera as an example of un-limiting-of this invention, it has inclusion storage and the non-interrupting formula service same for other small (palm top terminal, tape, wrist watch, etc. are needed) equipments used by the owner may be offered.

[0015]

[Embodiments of the Invention] Reference of a drawing, especially drawing 1 illustrates the network of a server. A server can communicate through the known arbitrary networks 111, such as the Internet, intranet, and a telephone network. Here, 1 or the server beyond it communicates with 1 or the inclusion personal computer beyond it. For example, according to the method and system of this invention, the transmitting server 102 is incorporated through a cellular channel (radio connection or infrared connection), and can communicate with the digital pen 109 which is wear rubble equipment.

[0016] A network system contains the transmission servers 100, 101, and 102, the network/Internet 111, and the storage server 112 typically. A transmission server can transmit and receive a radio signal between pocket equipment equipped with the cellular (it is (like cellular telephone)) transmitter. Drawing 1 shows cameras 103 and 106, a video camera 104, the smart phon 110, the tape 105, the palm top terminal 107, the wrist watch 108, and the digital pen 109 as an example of pocket equipment equipped with the cellular transmitter. These equipments can communicate various kinds of information, such as digital one, an analog, video, an audio, a text, voice, and a static image. These equipments may be used for people who are in the zone of a transmission server. People have a camera, walk, or carry a tape and a wrist watch and work in office. Generally, a zone (for example, 170) is the physical distance which the transmission server 102 incorporates in it and can communicate with a personal computer.

[0017] You may overlap, although a zone changes with transmission servers. Drawing 1 has a camera 103 in the zone of the transmission server 100, a tape 105 is in the zone of the transmission

server 101, and an example that the smart phon 110, the palm top terminal 107, the digital pen 109, and a wrist watch 108 are in the zone of the transmission server 102 is shown. A video camera 104 is in the zone of both transmission servers 100 and 101 (since it is easy, the lap of both zones has been omitted in drawing 1). When equipment is placed into the zone where transmission servers overlapped, these servers interact among these servers, in order to establish the sequence which downloads data from this equipment (link 114). Drawing 3 has given the example of such an interaction protocol.

[0018] The position and zone of a transmission server may be chosen by the same method as the cellular transmitter for a cellular phon. A transmission server is connected with the Internet backbone 111 in the gestalt of operation of this invention. Thereby, it is an interaction between servers (for example, when it has the zone where two or more servers overlap) (or communication with the storage server 112 is attained.). The information (it can divide depending on the case)/photograph which the user downloaded in the storage server 112 can be looked for and required. The storage server 112 can communicate with a user's personal computer (PC) 113 through the Internet 111. The special integrated program currently performed with PC113 mixes the storage server 112, and (it connects with PC113) the photograph from a camera 115 according to the exact order (refer to an example with detailed drawing 6) of the date, or other user instructions (following description for example, the photograph theme or others was remembered to be).

[0019] Reference of drawing 2 illustrates some cameras (or other inclusion personal computers) by the method and system of this invention. A camera 200 includes the flash memory (RAM) 201 a photograph is remembered to be, a board 203, and the communication port 202 for sending data through a communication (radio) circuit. A board 203 contains frame (frame is generated from incorporated picture and they are memorized to RAM201) element 203a, and communication element 203b for choosing a frame from RAM201 and sending to the communication port 202. With 1 operation gestalt, a board 203 uses 8MB of space.

[0020] The same composition may be applied to other equipments which have the input unit 208 of a frame prehension machine and others. For example, a pen input can be attained using all the same components as drawing 2. In this case, input units 208 are well-known pen / template input unit. Or when a small ball is attached in the end of a pen and a pen is pushed on paper or an electronic template, a user's handwriting information can be recorded. This recorded information may be memorized in the memory 201 of a pen like the case of an above-mentioned camera.

[0021] If the camera is not reloading the data to the transmission server 102, the task performed by frame element 203a may be performed in the space used by communication element 203b. When a camera reloads data from RAM201 to the transmission server 102, a frame board uses a part of communication element 203b. On the contrary, when it is not, and a camera is not taking a photograph and data are reloaded, communication element 203b uses the space from the element. The multitasking processor 206 enables sharing of the space from a board 203 for frame processing and a frame re-load task.

[0022] As for a counter / memory monitor 204, the space of RAM201 carries out counting only of which for whether it is occupied. This information is used by communication element 203b in order to determine whether start download of the data from RAM201 to a transmission server. Generally, if 80% or more of RAM201 is already occupied by information/photograph, it is necessary to reload data. In this case, communication element 203b transmits an alarm signal from a port 202. If which transmission server in the zone in which the camera is located receives this alarm signal, the server can start the re-load of data from RAM201. Or the method of reading the information with which the transmission server contacted this camera 200 periodically, and was remembered to be in the counter / memory monitor 204 is also possible. If it turns out that the occupancy space of RAM201 exceeded the permissible dose by that cause, the transmission server will start re-load procedure.

[0023] A module 205 is the instruction 400 (for example, the e-mail address the picture which which photograph should not have been moved from RAM201, or it reloaded should be remembered to be is shown.) of the option about data transmission. It includes "refer to drawing 4 ." These instructions are introduced by the user from an input unit 208, and may be displayed on the liquid crystal display (LCD) 207 of a camera 200. The data transmitted through a port 202 from RAM201 may be compressed and enciphered in compression / code module 209 of an option. Generally, a

compression method changes with kinds of data. The compression method suitable for it is used for a text object (for example, user instruction) (for example, refer to Computer Science Press in James A Storer work, Data compression, methods and theory, and 1993). Voice data (in for example, the case of a video camera) is Sadaki. Furui, M. Mohan The volume on Sondhi, Advanced in Speech Signal Processing, Niki carried by 1991 It may be compressed using the coding technology indicated by paper "High-Quality Coding of Telephone Speech and Wideband Audio" by Jayant.

[0024] A module 210 divides information (sent to RAM201 from 203a) into two or more portions (henceforth a part for an information bureau). Furthermore, additional descriptive information (151 in drawing 1) may be offered with information including the content. For example, since a part for an information bureau is characterized by the identifier, it may be used. A part for an information bureau can be characterized with those molds (video, an audio, a text, digital one, an analog, music, cleanness, noise, color, etc.). These labels may be offered with an input unit peculiar to an informational mold. For example, a microphone driver can discriminate information as an audio.

[0025] Label attachment of parts for some information bureau is carried out as movement being possible or movement being impossible. In the case of being the simplest, it is discriminated by the clocked into that it is different data (for example, snapshot) caught by pocket equipment at the time when the amount of each information bureau differs. The caught picture may be divided into two portions in the case of being more complicated. The first portion is a portion which expresses this picture by low quality of image, and a user is remembered that it can take out this picture in RAM201. The second portion which complements this picture is sent to a server, when RAM201 becomes an overload. This complement portion can be used later, in order to reconstruct the picture of perfect quality of image by unifying with the first related portion memorized in RAM201.

[0026] For example, the first portion from a picture may contain the pixel in every [in alignment with both axes of coordinates] three. Although this is low quality of image comparatively, it gives the picture which can be recognized by the user. This portion of a picture has less storage capacity than the picture of perfect quality of image, ends, and may be memorized into RAM201. Including the remaining pixels, the second portion of a picture may be temporarily memorized into RAM201 until it is transmitted to a server. A user connects a camera to client-server, and if a part for the corresponding information bureau which searched a part for the information bureau the server is remembered to be by the camera, and was seen off in the server before is downloaded, these two portions can be unified. The division module 210 carries out the indexing of the part for an information bureau, and memorizes this information to RAM201 again. These indexes help to connect a part for the memorized information bureau with those related portions. For example, the amount of [which is transmitted to a server] information bureau has a number shaken, and these numbers are memorized into RAM201 with a related portion. Then, in order to take out the portion which is integrated [taking place] processing and is in agreement, the memorized index number is transmitted to a server (from a client). The still more complicated index which shows the composition for a different information bureau is also possible.

[0027] Whatever the kind (for example, the audio and video data in a video camera) of data may be, the same division and the same indexing for an information bureau can be performed.

[0028] The data split of the division module 210 may be performed partially in not inclusion equipment 200 but a central transmission server, 102 [for example,]. In order that the calculation capacity of inclusion equipment may perform the whole division procedure, when not enough, the direction which performed this function by the server 102 rather than inclusion equipment is accordant to **. For example, time and a date may be offered by the transmission server 102 as additional descriptive information.

[0029] If the function of the division module 210 is performed by the transmission server 102, this transmission server 102 will incorporate the copy of the whole information which should be divided, will get it from equipment, 109 [for example,], and will divide it in accordance with the criteria in a server. These criteria can require that the amount of [after division] information bureau should be complementary. For example, in order for the amount of part I to express the whole content, it comes out enough and is a certain power, and the additional data needed in order to reconstruct the information on original completely should be included by the amount of part II.

[0030] The following is a non-limiting-like example which shows this principle. The photograph

data in a camera are divided to two or more portions corresponding to a different (a photograph was taken at different time) photograph. This division is usually performed in a camera (this is a part of camera processing, and does not need additional calculation capacity). A part for these data divisions is copied to a remote server. About a part for each data division, a server calculates two subportions. It can eliminate what should remain into a camera.

[0031] For example, the first subportion may contain all the pixels in every three (both axes of coordinates were met). A server sends an instruction to a camera, the 1st subportion for data division is memorized by the camera by that cause, and the 2nd subportion is eliminated.

[0032] Reference of drawing 3 shows an example of acquisition / re-load of data 150 in case a camera 200 is in two zones of the transmission servers 100 and 101. In this example, it is assumed that the owner of a camera is moving to zone 170A which belongs to the transmission server 100 from zone 170B belonging to the transmission server 101. Numbering of the frame in RAM201 corresponds to the time scaling 305. A camera 200 reloads the photograph frame to which the number of No. 1 and No. 2 in RAM201 was attached to the storage 303 in a server 101, while being in zone 170B belonging to a server 101 (the number is maintained). When a camera 200 reaches to zone 170A of a server 100, the photograph frame to which the number of No. 3 and No. 4 in RAM201 was attached is reloaded to the storage 304 in a server 100 (the number is maintained). In this example, since the instruction has not permitted the re-load of the frame of No. 0, No. 5, and No. 6, a camera 200 does not reload those photograph frames. The criteria from which it differs [when a re-load is changed to other servers and] for determining a camera communication processor are possible. These criteria may contain the following.

- a) Change to the server near a camera (the signal from the camera received by the usually nearest server is the strongest).
- b) Set a server in order by a certain method, and reload data to the server which has the highest priority (among the servers which can receive).
- c) A transmission server has a dialog among them in order to determine the server which reloads data. When busier than a server besides for the re-load from camera with one of another servers, it can determine to reload from) to the server which is not busy according to the protocol of (transmission server).

[0033] (to a different server) Since those numbers are maintained, the frame which it reloaded is memorized by the storage 301 of the storage server 112 according to the number in RAM201 of a camera 200 (this example 1, 2, 3, 4). (For example, after this user goes home) By connecting a camera 200 to a user's PC113, all photographs are unified in perfect sequence 0, 1, 2, 3, 4, 5, and 6 from a camera 200 and the storage server 112 (it is referring to drawing 6 for details).

[0034] Reference of drawing 4 shows an example 400 of an instruction to LCD207. The line 401 has asked the user about whether a transmission server may reload a certain photograph taken a photograph. This question may be displayed on LCD, whenever a user takes a photograph. Since a photograph can be seen on LCD of a digital camera after it is memorized in RAM, in order to see for some users later, it may like holding some photographs in their camera.

[0035] As an example, **** of a line 401 is in a user's reply ", and contains ". The following line 402 contains a user's e-mail address. A transmission server can use a user's e-mail address, in order to offer the address for the data which reloaded in the storage server. **** (being) of a line 402 shows that a user accepts this address. A line 403 checks whether the degree whose transmission server is the re-load of data should be asked for the permission from a user. **** (no) of a line 403 has given permission of the non-interrupting type re-load of data (that is, a server does not need to ask for the permission from a user for a re-load). A line 404 is full of RAM and establishes the criteria when reloading data. A line 405 requires that a re-load should be started from the photograph taken more early. A line 406 includes additional description of the taken photograph (for example, MOSCOW, MAVZOLEY, 1/18/2000). These description may be inputted by the user while taking the photograph. In the line 411, he is asking to the user whether it agrees with seeing the photograph memorized in the camera by low quality of image. When a user is in " (it is this example like) and it is answered as ", a part for each data division corresponding to the memorized photograph is divided into a part for a part for part I containing the photograph data of low quality of image, and part II which it reloads to a remote server (in order to reconstruct the photograph of behind perfect quality

of image). The module 410 shows the possible method of inputting data, while a user orders. Some instructions may be offered with the button 407 of a camera (for example, it crawls and the reply of no [/] may be easily inputted by this method). A more complicated reply may be created by the keypad 408 attached in the camera.

[0036] Finally, the automatic speech recognition (ASR) incorporated into the camera chip is a natural method for inputting a user instruction. An input may be similarly offered to other inclusion equipments (a video camera, palm top terminal, etc.). The product information for inclusion ASR can be seen by the Internet (www.lhs.com/speechtech/embddevtools/asr.asp). An electric-type pen can also be used for offering an input. The example of use of an electric-type pen can also be seen by the Internet (www.execpc.com/-catrina/pen/).

[0037] If drawing 5 is referred to here, the general sequence of the step of processing for acquisition / re-load of data is shown. At the first step 500, in order that a transmission server may check whether the RAM is full to inclusion equipment (for example, camera), a signal is transmitted periodically. Or inclusion equipment can transmit an alarm signal to a server, in order to tell that the RAM is full. At Step 501, one transmission server, 102 [for example,], downloads data from inclusion equipment (when it receives the signal that RAM is full). When it is in the zone where inclusion equipment overlaps at Step 502, the transmission server which has those zones has a dialog mutually, as it mentioned above to which server data should have been transmitted in order to determine. At Step 503, the data memorized in the transmission server download to the storage server 112 through the Internet. At Step 504, the data memorized in the storage server 112 are transmitted to a user's computer based on other criteria of the total amount of a demand of a user, time, or information 150. Step 504 may be skipped when this function is performed by the transmission server. At Step 505, the data from the storage server 112 and inclusion equipment are unified in a user's PC using the descriptive information (for example, descriptive information 151 and instruction 400 may be included) of the date and others.

[0038] When drawing 6 is referred to, the storage server 112 contains the photograph frame 602 (information 150) memorized by RAM201 of a camera 103 in order of 1, 2, 3, and 4 in the same sequence as origin, and includes the description 604 related further. It may be necessary to carry out the group division of the photograph according to the theme depending on description 604, for example. the photographs 0, 5, and 6 which remain into RAM201 of a camera (the storage server 112 does not reload) ... is continuously memorized with those description 603 in RAM201. The storage server 112 is connected with a user's computer 113 through the Internet 111. The direct file of the camera 103 may be carried out to a user's computer 113. A program 600 unifies the photograph frame memorized in the storage server 112 and the camera 103 according to those numbers, description, and the user instruction 606 in a computer 113. These instructions 606 carry out the group division of the photograph according to those theme description, and can require that a photograph should be memorized to a time order in each group. In this example, two photograph groups, the photograph of a number called 0, 5, and 6 and the photograph of a number called 1, 2, 3, and 4, are memorized by those numerical orders of 0, 1, 2, 3, 4, 5, and 6.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] The pocket calculation equipment which leaves the portion chosen in for the information bureau divided by memory, input means to by _ which the aforementioned memory can be made to memorize information, division means divide into two or more portions the information memorized by the aforementioned memory, and the aforementioned division means to the aforementioned memory, and includes a means release the aforementioned memory by transmitting other portions to a server.

[Claim 2] The aforementioned information is equipment according to claim 1 which is video information, a static image, a text, voice, or digital information.

[Claim 3] Equipment according to claim 1 which contains further the descriptive information which describes a part for the aforementioned information bureau.

[Claim 4] The aforementioned descriptive information is equipment according to claim 3 in which it is shown whether a part for the aforementioned information bureau can be deleted.

[Claim 5] Equipment according to claim 4 with which a part for an eliminable information bureau is transmitted to the aforementioned server.

[Claim 6] The aforementioned descriptive information is equipment according to claim 3 in which the kind or priority for the aforementioned information bureau is shown.

[Claim 7] It is equipment according to claim 1 divided into a part for part II for the aforementioned information being a photograph, and the aforementioned division means complementing a part for a part for part I of low quality of image, and this part I for the aforementioned photograph, and reconfiguring the original photograph.

[Claim 8] The aforementioned means which carries out release is equipment according to claim 7 which leaves a part for aforementioned part I to the aforementioned memory, and opens the aforementioned memory by transmitting a part for aforementioned part II to the aforementioned server.

[Claim 9] It is the server carry out that the amount of [by which selection was carried out / aforementioned] information bureau is what reconfigurates the information on original when unified with a part for the information bureau memorized by the aforementioned pocket calculation equipment as the feature including a means receives a part for the information bureau which is the server in which pocket calculation equipment and communication are possible, and was chosen from the aforementioned pocket calculation equipment through a network, and memorize.

[Claim 10] The server according to claim 9 which includes further a means to determine how the information memorized by the aforementioned pocket calculation equipment is divided.

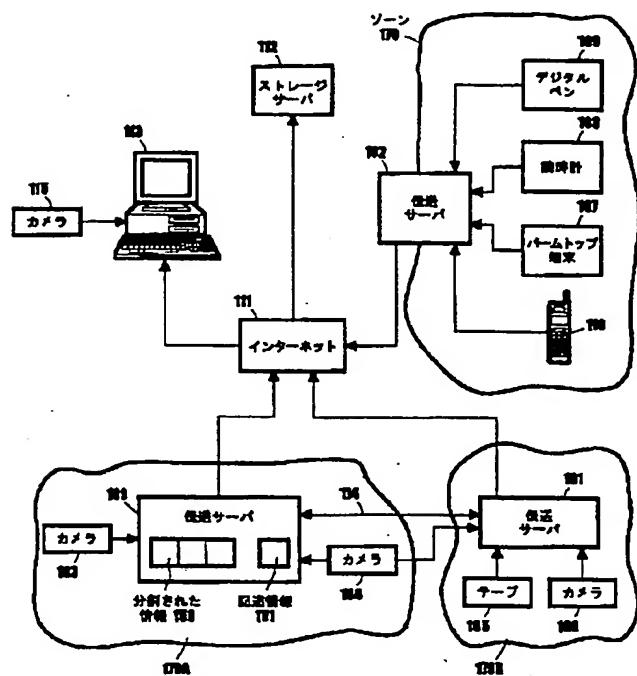
[Claim 11] The server according to claim 9 or 10 which includes further a means to transmit a part for the information bureau by which selection was carried out [aforementioned] to other storage servers or the client of a requiring agency.

[Claim 12] The system for transmitting the information in the memory of pocket equipment to a network characterized by providing the following. A means to determine whether be in the zone of the server by which the aforementioned pocket equipment was connected to the aforementioned network. A means to transmit the information as which the aforementioned memory was chosen to the aforementioned server, and to delete from the aforementioned memory when a means to determine whether fulfill the criteria for transmission of the aforementioned memory, and the

aforementioned pocket equipment are in the aforementioned zone and the aforementioned memory fulfills the aforementioned criteria.

[Translation done.]

Drawing selection [Representative drawing]



[Translation done.]